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ABSTRACT

This study examined the extent to which an individual doctoral student's characteristics and involvement in the academic and social life of the department influences the student's perception of growth and development during graduate school, and thus the student's persistence in pursuing a graduate degree. The study surveyed doctoral students (N=711) attending a research university in the Midwest during fall of 1991. Analysis of survey responses (N=570) indicated that students' involvement in the program, especially involvement with the faculty and intellectual involvement, directly influenced students' intention to persist. Intellectual involvement and students' satisfaction is a function of age, gender, and marital status. Older students expressed higher intellectual involvement than younger students, and female students appeared to have higher intellectual involvement than males (contradicting some previous studies about women doctoral students). Results suggest that graduate programs may eliminate some barriers to the progress of students toward doctoral degrees by implementing such policies as providing financial, social, and faculty support. (Contains 33 references.) (PRW)

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THE EFFECT OF DOCTORAL STUDENTS' BACKGROUND, INVOLVEMENT, AND PERCEPTION OF GROWTH ON THEIR INTENTION TO PERSIST

Paper presented at the Annual ASHE Conference

Memphis, TN

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This paper was presented at the annual meeting of the Association for the Study of Higher Education held in Memphis, Tennessee, October 31 - November 3, 1996. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

The Effect of Doctoral Students' Background, Involvement, and Perception of Growth on their Intention to Persist

In a longitudinal study of doctoral programs from 1958 to 1988, Bowen and Rudenstine (1992) report that of all those who enter a doctoral program, only about half actually complete their program. This extensive study examined English , history, economics, political science, mathematics, and physics doctoral programs at ten major research universities. The Digest of Education Statistics (1985- 1986) also reports that during the years 1978-83 approximately 3,043,612 doctoral student were registered but only slightly over 32, 000 earned doctoral degrees. According to Bowen and Rudenstine the lower graduation/ completion rate is more evident for the students in humanities and social sciences who also show longer time to degree completion compared to other students.

In recent years there has been an increased level of concern with regard to graduate students in general, as is evident by the large number of studies conducted and published on this subject. However, there is very little systematic research conducted about graduate students' persistence/ degree progress (Malaney, 1988). This could be partly because of the difficulties that exist in designing such studies, given the complexities and interrelationships of factors involved (Girves and Wemmerus, 1988, Girves; Wemmerus, and Rice, 1986). Although these studies indicate various factors affecting students' completion rate, one reemerging factor that stands out across studies is students' social and academic involvement/ interactions within the department and their attitudes toward the nature of these interactions.

Baird (1990) and Stein & Weidman (1990) described graduate education as a process of socialization and preparation for future professional roles. The socialization process involves

learning values, principles, norms, and skills which can lead to a professional identity (Bragg, 1976, Katz 1976). The socialization process can be defined in terms of a graduate student's integration into the intellectual, academic, and social life of the department by way of research, participation in seminars, conference attendance, and interaction with peers and faculty, both formal and informal (Tinto 1991). Students pursue graduate education for varying reasons such as personal satisfaction and fulfillment, professional advancement, and better job prospects (Malaney 1987). These varying reasons entail certain expectations that sometimes are not fulfilled. Baird (1978) suggested that this discrepancy between what students expect before entering graduate school and their actual experiences can lead to dissatisfaction and a desire to drop out or considering changing to another program before degree completion.

The purpose of this study is to estimate a path analytic model that examines the extent to which the individual students' characteristics and involvement in the academic and social life of the department influence the student's perception of growth and development during graduate school which in turn can influence their decision to stay or drop out. The principle focus of this model is graduate students' involvement and their' perceptions of growth and development as a result of graduate education which are viewed as primary influences on student persistence (Tinto 1991). This path model is based on a similar model proposed by Girves and Wemmerus (1988) in which they developed a conceptual model of graduate student degree progress built upon the theoretical and empirical work of Bean (1980, 1982), Pascarella (1980 & 1983), Spady (1971), and Tinto (1975). The outcome variable in this study is not persistence per se, but an indicator of the students' commitment toward continuing their graduate studies which is a precursor to persistence decisions.

Tinto (1991) suggested that the undergraduate theory of persistence can serve as a guide to

research on graduate students' retention; however, the specific characteristics of graduate life in terms of their reference group, community, and specific field of study should be taken into the consideration. Other studies on doctoral students persistence such as Thomas, Clewell, and Pearson's (1987) supported the assumption that similar to undergraduate students, interaction with the faculty and peers within the department at the graduate level not only contributes to intellectual development but also to learning and developing the social and academic skills and competencies expected at this level (Tinto 1991, Goplerud 1980). The individual student's experiences and satisfactions, with the degree of these involvements and their attainment of the perceived and expected growths, result in their consequent judgement about their professional and personal goals that can influence their decision on whether to continue with graduate work (Zwick, 1991).

Students' interactions with the faculty greatly influence students' socialization processes and growth. Faculty, as Baird (1991) pointed out, "can serve as role models and mentors, develop a consistent set of goals for the program, and provide a sense of collegiality among the faculty and students" (p. 4). Heiss (1970), Lozoff (1976), and Konner (1987) suggested that the interaction with other students can provide graduate students with social and emotional support and advice on how to cope with the demands of graduate work that can reinforce students' interest and commitment. Holding a position as a graduate assistant as either a teaching assistant or research assistant is also believed to contribute to the socialization and professional development of graduate students in which the students can learn the principles, norms, and values of their professional field and understand the intricacies of the academic and intellectual environment (Girves and Wemmerus 1988; Tinto 1991). Roaden and Worthen (1976) and Cook and Swanson (1978) reported that students who were actively involved in research projects and ,as a

result, had more interactions with faculty members were more productive and had a higher completion rate. Ethington and Pisani (1993) note that students who hold graduate assistantships, especially those who hold research assistanship, have a higher perception of professional growth. This could be because of the collaboration that occurs between students and faculty that produces a wide range of benefits through formal and informal education (Anderson, 1996)

Understanding and recognizing factors that influence students' decisions as to whether or not to continue with their academic pursuit at doctoral level is warranted in order to develop better institutional policy that encourages students to complete their degree within reasonable time (Tinto, 1991).

METHOD

Model

This path analytic model was formulated based on a previous model of graduate student degree progress proposed by Girves and Wemmerus (1988). Their conceptual model evolved from the theoretical and empirical work of Tinto (1975), Spady (1971), Pascarella (1983), and Bean (1985) in which satisfaction and alienation are related to the concept of academic integration and socialization . Socialization is considered the important factor in explaining students drop out behavior and retention at the undergraduate level. However, Girves and Wemmerus incorporated two other critical factors such as student/ advisor relationship and financial support (graduate assistantships) as considered fundamental to the graduate education experience. Their model contains two stages. The first stage includes four sets of variables related to departmental characteristics, student characteristics, financial support, and student perceptions of their relationship with faculty. The second stage of their model contains four variables that are

expected to directly affect the degree progress. These intervening variables are graduate grades, involvement in one's program, satisfaction with the department, and alienation. Our model, shown in figure 1, incorporates similar constructs. In this path model, exogenous variables are assumed to be correlated and their variabilities are explained by causes outside the model. The reason for their correlations are not being analyzed in this study. The variabilities of the endogenous variables are explained by exogenous and other endogenous variables within the model. Variables within the blocks are correlated but not causally related.

Insert Figure 1 about here

The first block of variables (length of time in the graduate school, financial impediments, marital status, enrollment status (full time or part time), and students' age and gender) are exogenous variables. These variables are included in the model to control for their effect, in order to study the effect of endogenous variables. Students' intellectual involvement, and their involvement/ interaction with peers and faculty, and holding graduate assistantships are endogenous variables that constitute the second block in the model. These are the variables that indicate the degree of students' involvement in the program that affect their perception of gains and eventually contribute to the students' decisions /commitment to the completion of their program. The final block of variables contains students' perception of growth in the area of human relations, research and reflective thinking. The last variable in the model is the outcome variable- students' intentions to persist, which is an indication of their commitment to the program or to

completing their doctoral program.

It is hypothesized that students' intention to persist is directly influenced by the students' perceptions of growth and development in the area of human relations, research competency, and reflective thinking. Students' perceptions of development and growth are in turn influenced by students' degree of their academic and social interaction and involvement within the department. Graduate students' social, academic, and intellectual involvement are also influenced by differing backgrounds of the students that may originate from the length of time the students have been in the program, financial impediments, marital status, enrollment status, gender, and age.

The Data

This study is based on data from a cross-sectional survey of graduate students conducted in spring 1991 at a Research I University in the Midwest (Baird & Smart 1991). In this study a broad sample of graduate students and their interactions with their institutions were examined. The respondents were all graduate students attending the university in the Fall of 1991. The questionnaire consisted of 257 items that assessed such variables as; basic demographic and educational information, financial and work information, educational motivation, students relation with faculty and peers, program demand, personal and professional growth. Only doctoral students were selected for this study. Of the 711 doctoral students at the university, 603 completed surveys were returned resulting in a response rate of 85 per cent. The analyses conducted in this study were based on the 570 doctoral students who had complete data for the variables described below. The variables that operationalize the constructs of our theoretical model were drawn from items included in the questionnaire. The construction of these variables is described in Table 1.

Insert Table 1 about here

Analysis

Prior to the estimation of the model preliminary analyses was conducted to examine the possibility of interaction effects by gender or marital status. This was done by calculating the cross-product of gender and the other independent variables and secondly, marital status and other independent variables. Each equation defining the model was then estimated and each set of interaction terms then added and the increase in variance explained calculated. This was done separately for the gender and marital status interaction terms. In no instance was there a significant increase in variance explained as a result of interactive effects. Thus, the model was estimated for the full sample and gender and marital status were included as exogenous variables. The GEMINI (Wolfle & Ethington, 1985) program was used to estimate the causal model. The analysis was conducted using the means, standard deviation, and correlations (Table 2). The direct causal effects were represented by standardized (beta weight) or unstandardized (B weight) regression coefficients. The indirect effects were estimated by the sums of the products of direct effects through mediating variables in the model. The total causal effects were estimated by the summing of the direct and indirect effects. The comparison of the standardized coefficients determines the relative influence of variables within an equation.

Insert Table 2 about here

RESULTS

The results indicate that the variables in the model explain about 40% of the variance in students' intention to persist. Figure 2 indicates the significant paths of influences within the model. Contrary to the hypothesized paths, none of the three variables representing students' perceptions of growth which were expected to have the only direct effect on students' intention had any significant direct effect on intention to persist. However, significant direct effects were found on the students' intention to persist from students' intellectual involvement, their interaction with the faculty, and from three of the students' background variables (financial obligations, students' enrollment status, and age). These significant direct effects are not in keeping with our main hypothesis. The dominant influence on intention to persist comes from students' intellectual involvement and their interaction with the faculty with their respective betas of .349 and .242. Students' enrollment status, age, and the extent of their financial responsibilities have much less direct influence on commitment with betas equal .079, .105, and .085, respectively. These positive influences suggest that those students, who are older, attend full-time, are more academically involved and have higher degree of interaction with the faculty, and those who have less financial difficulty are more likely to intend to persist in their programs.

Insert Figure 2 about here

Although significant direct effects were found from intellectual involvement, and interactions with the faculty and peers on the three perceptions of growth variables, these measures of growth were not instrumental in impacting intention to persist, since no significant direct effect were

found from these variables on the outcome variable. However, our hypothesis that students' academic, social, and intellectual satisfaction would influence their perceptions of growth and development was supported.

The results also show that the length of time the individual student stays in the graduate program has a direct effect on their perception of growth in research. Financial impediments have a direct effect on students' perception of gain in human relations. Students' enrollment status (part-time/ full-time) also shows a significant effect on students' perception of growth in reflective thinking. These last three effects were not expected.

It was hypothesized that all background variables would have significant effects on the four variables indicating students' involvement. Significant direct effects were found from students' marital status (divorced), gender, and age on intellectual involvement (betas = .130, -.139, and .099, respectively). As can be seen, the positive effects indicate that those students who are older and divorced have more intellectual involvement, while the negative effect of gender suggests that male students are less satisfied with their intellectual involvement. None of the background variables contributed significantly to students involvement with the faculty. Students' involvement with their peers was significantly influenced by their enrollment status and gender, in that full-time and female students were more involved with their peers (betas=.115, and -.134 respectively). Holding a graduate assistant position is influenced by the length of time in the program, students' financial conditions, enrollment status, and age (betas= -.180, -.089, .329, and -.328, respectively). This means students who mostly hold these positions, are those who have been in school for a longer period of time, perceive fewer financial impediments, attend full-time, and are younger.

Insert Table 3 about here

The indirect and the total effects of the variables in the model on students' intention to persist were also examined are given in Table 3. As can be seen of all the indirect effects only two are statistically significant at the .05 level. The marital status indicator divorced, has significant positive indirect influence (.0808), and gender has a significant negative influence (- 0948) on intention to persist. The influence of these two variables on the outcome variables is mediated through intellectual satisfaction. This means female and divorced students have more intellectual/ academic involvement and therefore are more committed to completing their degree. Intellectual involvement has not only a significant direct effect on intention to persist but is also the intervening variable through which marital status and gender affect the intention to persist, therefore, it can be considered a primary variable in this model.

The total effects of the variables in the model are the results of the combined direct and indirect influences. Intellectual involvement and involvement with faculty have the largest total influence of any variables, which is the result of their significant direct effects on commitment. Students' perceived financial burden, age and gender also show significant total effects to a lesser degree. Although no significant indirect effect was found from financial conditions and age on commitment, when the direct and indirect effects were combined their influences were strong enough to result in these significant total effects. The significant total effect of gender is the result of its significant indirect effects on commitment. The total effects are also shown in Table 3.

CONCLUSIONS

While some of the hypothesized patterns of effects were not forthcoming, the importance of students' involvement was reinforced. The results indicate that students' involvement in the program, especially involvement with the faculty and intellectual involvement, directly influence students' intention to persist. These findings support previous studies by Girves and Wemmerus (1988) and Baird (1990). Therefore it can be concluded that it is what students do while in the program and their attitude about these involvement and not what they think they gained that appear to influence students' commitment to continue with their program. In this study intellectual involvement, and students' satisfaction is a function of their age, gender, and marital status. Our findings suggest that older students expressed higher intellectual involvement than their younger counterparts, and female students appear to have more intellectual involvement which can translate into more commitment to completion of their degree. This finding contradicts some of the studies about women doctoral students. According to Baird (1990) women students because of their multiple roles and responsibilities are often unable to attend school full-time or hold assistantships, therefore they are less likely to form any personal contact with other students and faculty. Most women do not have the social network and support system that is often provided for other students by virtue of spending more time with other fellow students and faculty in the department . Baird (1990) states that the stress that is resulted from the lack of forming a positive and successful relationship can cause a feeling of isolation, resentment, and competition that may lead them to emotionally or physically withdraw from the program. However other studies such as Hartnett (1981) and Hite (1985) suggest that different fields of study can influence women students differently. For example Hartnett reported that female graduate students in psychology were more satisfied with their learning environment, had greater faculty support, and

higher quality of assistantship experience than those in history. Unfortunately, in our study we were not able to examine the interaction of the specific field of study and gender. Another limitation of this study is the use of data from one institution that limits its implication to some extent. Perhaps future research is needed to compare female students' involvement according to the different field of study. This study did not examine the relationship between the different stages of doctoral program and the degree of involvement. As Tinto (1991) pointed out the degree of students' need for support and involvement changes at each stage of the program.

Although committing to a long-term goal such as pursuing a doctoral degree requires such personal qualities as high motivation and perseverance, the crucial role of departmental factors can not be denied (Girves & Wemmerus, 1988). As is evidenced in this and numerous other studies, graduate programs by implying such policies as providing financial, social, and faculty support can to a great extent eliminate some of the barriers to students' degree progress.

REFERENCES

Anderson, M. S. (1996). Collaboration, the doctoral experience, and the departmental environment. The Review of Higher Education, 19 , 305-326.

Baird, L. L. (1978). Students expectations and the realities of graduate and professional schools. College and Universities, 54, (1), 68-73.

Baird, L. L. (1990). The melancholy of anatomy: The Personal and professional development of graduate and professional school students. In J. C. Smart (Ed.). Higher Education: Handbook of Theory and Research, 6, New York: Agathon.

Baird, L. L., & J. C. Smart (1991). The graduate student experience: Theoretical and research rationale for a project to study graduate education. Paper presented at 1991 meetings of Association for the Study of Higher Education.

Bean, J. P. (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition. Research in Higher Education, 12, 155-87.

Bean, J. P. (1982). Student attrition, intentions, and confidence: Interaction effects in a path model. Research in Higher Education, 17, 291-320.

Bean, J. P. (1985). Interaction effects based on class level in an explanatory model of college student dropout syndrome. American Educational Research Journal. 22, 35-64.

Bowen, W. G., & Rudenstine, N. L. (1992). In Pursuit of the Ph. D. Princeton, N.J.: Princeton University Press.

Bragg, A. K. (1976). The socialization process in higher education.(Eric/ Higher Education Research Report), 7. Washington, D.C.: American Association for Higher Education.

Cook, M. M. & Swanson, A. (1978). The interaction of student and program variables for the purpose of developing a model for predicting graduation from graduate programs over a 10 year period. Research in Higher Education, 8, 83-91.

Digest of Education Statistics, (1985-1986). Office of Educational Research and Improvement. U. S. Department of Education-Center for Statistics.

Ethington, C. A., & Pisani, A. (1993). The RA and TA experience: Impediments and benefits to graduate studies. Research in Higher Education, 34, (3), 343-354.

Girves, J. E., Wemmerus, V., & Rice, J. (1986). Financial support and graduate student degree progress. Paper presented at the annual meeting of Association for Institutional Research. Orlando, June.

Girves, J. E., & Wemmerus, V. (1988). Developing models of graduate student degree progress. Journal of Higher Education, 59, 163-189.

Goplerud, E. (1980). Social support and stress during the first year of graduate school. Professional Psychology, 11, 283-290.

Hartnett, R. T. (1981). Sex differences in the environments of graduate students and faculty. GRE Board Research Report, no. 77-26, Research Report.

Heiss, A. M. (1970). Challenges to Graduate Schools. San Francisco: Jossey-Bass.

Hite, L. M. (1985). Female doctoral students: Their perceptions and concerns. Journal of College Student Personnel, 26, 18-22.

Katz, J. (1976). Development of the mind. In J. Katz and R. T. Hartnett (Eds.). Scholars in the Making. Cambridge, MA: Ballinger.

Konner, M. (1987). Becoming a doctor: A journey of initiation in medical school. New York: Viking.

Lozoff, M. M. (1976). Interpersonal relations and autonomy. In J. Katz and R. T. Hartnett (Eds.), Scholars in the Making. Cambridge, MA: Ballinger.

Malaney, G. D. (1987). Why students pursue graduate education, how they find out about a program, and why they apply to a specific school. College and Universities, Spring.

Malaney, G. D. (1988). Graduate education as an area of research in the field of higher education. In J. C. Smart (Ed.), Higher Education: Handbook of Theory and Research, 4. New York: Agathon Press.

Pascarella, E. T. (1980). Student-faculty informal contact and college outcomes. Review of Educational Research, 50, 545-595.

Pascarella, E. T., & Chapman, D. W. (1983). A multi institutional pathanalytic validation of Tinto's model of college withdrawal. American Educational Research Journal, 20, 87-102.

Roaden, A. L., Worthen, B. R. (1976). Research assistantship experience and subsequent research productivity. Research in Higher Education, 5, 141-158.

Spady, W. (1971). Dropouts from higher education: Toward an empirical model. Interchange, 2, 38-62.

Stein, E., & Weidman, J. (1990). The socialization of doctoral students to academic norms. Paper presented at the Annual Meeting of the American Education research Association, Boston, April.

Thomas, G. E., Clewell, B. C., & Pearson, W. (1987). Case study of major doctoral producing institutions in recruiting, enrolling, and retaining black and Hispanic graduate students. A report to the Graduate record Examination Board, Princeton, New Jersey. September.

Tinto, V. (1975). Dropout from higher education: A theoretical syntheses of recent research. Review of Educational Research, 45, 89-125.

Tinto, V. (1991). Toward a theory of doctoral persistence. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Wolfle, L. M., & Ethington, C. A. (1985). Gemini: Program for analysis of structural equations with standard errors of indirect effects. Behavior Research Method Instruments and Computers, 17, 581-584.

Zwick, R. (1991). Factors contributing to persistence in graduate school. A paper presented at the annual meeting of the American Educational Research association, Chicago, IL.

TABLE 1. Variable Definitions

BACKGROUND INFORMATION	
Length of time in graduate school	Students' responses to "In what year did you begin work on the degree you are currently seeking". Ranging from the year 79-91.
Financial obligations	Student's rating of 'how much financial obligations is an impediment to your completion of your graduate program'. Ranging from 1= none to 4= very much.
Marital status	Included three categories of 1= single, 2= married, and 3= divorced. Dummy coded such that D1=married and D2=divorced. Each was included in the model separately and was compared with 0= single.
Enrollment status	Responses categories 1= full-time and 0= part-time.
Age	Students' responses ranging from 21 to 65.
Gender	Students' sex coded 0=female and 1= male.
INVOLVEMENT MEASURES:	
Faculty	A factorially derived scale computed by averaging across students' ratings of ten-items measuring students' involvement with faculty. All items were coded from 1="Strongly Disagree" to 5= "Strongly Agree". Alpha reliability=.86.
Peers	A factorially derived scale computed by averaging across four-items measuring involvement with peers. All items were coded from 1= "Strongly Disagree" to 5= "Strongly Agree". Alpha reliability=.62.
Intellectual/ Academic	A factorially derived scale computed by averaging across nine -items measuring students' intellectual involvement. All items were coded from 1= "Strongly Disagree" to 5= "Strongly Agree". Alpha reliability=.64.

Graduate assistantship	Recoded as 1=no assistantship 2= research assistantship, teaching assistantship, or both.

PERCEPTION OF GROWTH MEASURES:

People and human relations	Averaging across students' ratings of five items measuring students perception of growth in the area of human relations skills. Each item was rated from 1=None at all to 4=very much. Alpha reliability=.86.
Research competency	Averaging across students' ratings of three items measuring students' perception of growth in the area of research and data analyses. Each item was rated from 1=None at all to 4= Very much. Alpha reliability=.69.
Idea or reflective thinking competency	Averaging across students' ratings of six items measuring students' perception of growth about their reflective thinking skills. Each item was rated from 1=None at all to 4=Very much. Alpha reliability=.80.

MEASURE OF STUDENTS' COMMITMENT TO PERSIST.

Commitment/ Intention to Persist	Averaging across students' rating of nine items measuring students' degree of commitment to completing graduate work . Each item was rated from 1=Strongly Disagree to 5=Strongly agree. Alpha reliability= .73.

Table 2. Correlations, Means, And Standard Deviations (N= 571)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Commitment to persist	1.00														
2 Human Relation	.251	1.00													
3 Research	.234	.299	1.00												
4 Reflective	.375	.608	.489	1.00											
5 Faculty Interactions	.514	.275	.321	.434	1.00										
6 Peer Interactions	.200	.190	.199	.195	.245	1.00									
7 Intellectual Involvement	.566	.248	.211	.435	.588	.187	1.00								
8 Graduate Assistantship	-.062	.027	.009	.030	.033	.126	-.098	1.00							
9 Length of Time in School	.01	-.015	-.189	-.063	-.013	-.022	.001	-.067	1.00						
10 Financial Impediments	.09	-.119	.011	-.041	.059	.036	.024	-.085	-.006	1.00					
11 Married	-.0004	-.005	-.001	0.010	-.062	-.017	.063	-.057	-.006	-.146	1.00				
12 Divorced	.075	.007	.042	.035	.049	-.020	.106	-.128	-.130	.023	-.360	1.00			
13 Enrollment status	.021	.070	.024	.086	.027	.105	-.060	.451	.072	-.061	-.065	-.126	1.00		
14 Age	.120	.056	-.004	.039	-.029	-.048	.15	-.407	-.246	-.077	.254	.156	-.369	1.00	
15 Gender	-.119	-.025	-.005	-.007	-.047	-.106	-.16	.128	.045	.06	-.102	.019	.15	-.233	1.00
Means	4.029	2.546	2.971	2.931	3.46	3.06	3.58	1.677	87.8	2.92	.087	.574	.676	35.4	.464
St. Devs	.656	.806	.759	.603	.766	.897	.586	.467	2.23	1.00	.283	.494	.488	7.988	.499

TABLE 3. Indirect and Total Effects of Variables on Commitment

	Direct	Indirect	Total
Human Relations	.037		.037
	(.030)		(.030)
Research	.038		.038
	(.032)		(.032)
Reflective Thinking	.065		.065
	(.070)		(.070)
Involvement with Faculty	.242*	.033	.275*
	(.207)	(.028)	(.235)
Involvement with Peers	.042	.015	.057
	(.030)	(.011)	(.041)
Intellectual involvement	.349*	.024	.373*
	(.390)	(.027)	(.417)
Graduate Assistant	-.022	-.003	-.025
	(-.031)	(-.004)	(-.035)
Time in Graduate School	.048	.005	.053
	(.014)	(.001)	(.015)
Financial Impediments	.085**	.030	.115**
	(.056)	(.019)	(.075)
Married	-.017	.019	.002
	(-.038)	(.044)	(.006)
Divorced	.013	.061*	.074
	(.016)	(.081)	(.097)
Students' Status	.079**	.025	.104
	(.105)	(.033)	(.138)
Students' Age	.105**	.038	.143**
	(.008)	(.003)	(.011)
Students' gender	-.040	-.072*	-.112*
	(-.051)	(-.094)	(-.146)

Metric coefficients are given in parentheses.
*p<.01. **p<.05.

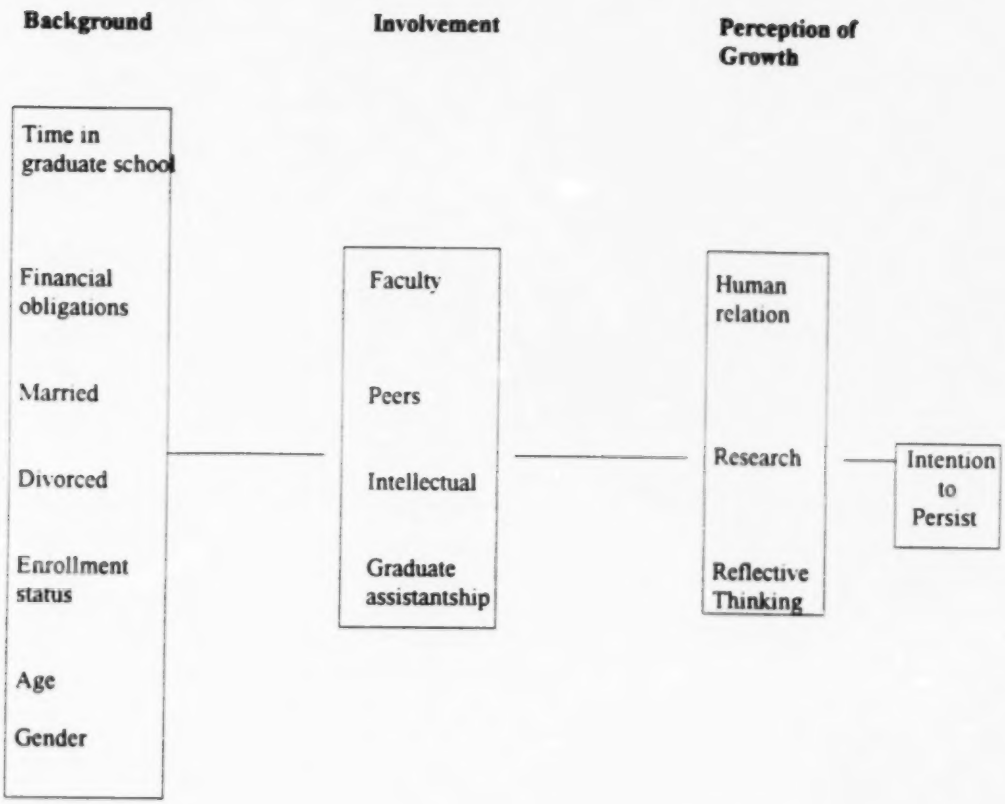

Figure 1. Estimated model of doctoral student intention to persist

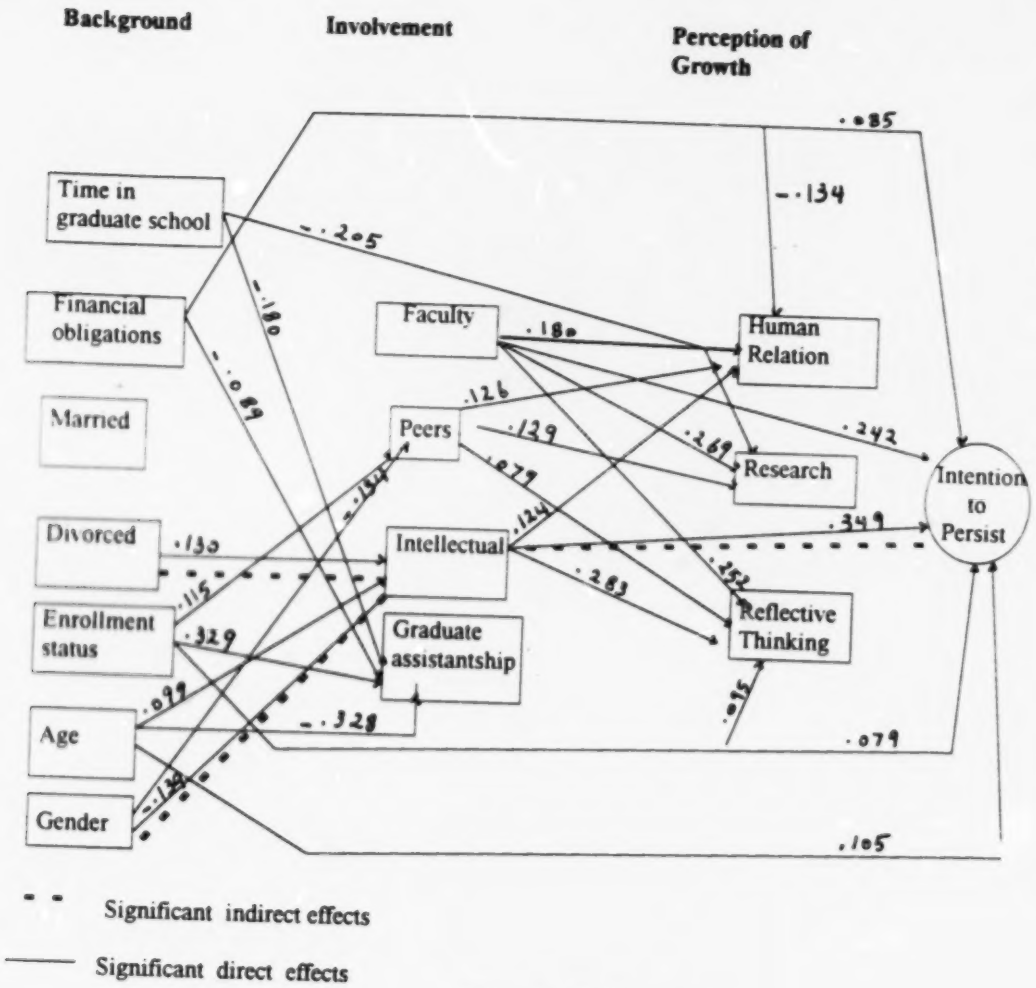

Figure 2. Significant paths.

APPENDIX A
Items Used in Construction of Scales

Involvement Measures

All of the items below ranged from 1= strongly Disagree to 5= Strongly Agree. Negatively worded items were recoded so that higher values are always associated with positive responses.

Faculty Interactions (Alpha= .81)
I'm dissatisfied with the opportunity to meet and interact informally with faculty members.
Nonclassroom interactions with faculty have had a positive influence on my personal growth.
Departmental faculty are available for individual consultation.
Departmental faculty treat female graduate students comparably to male graduate students.
Departmental faculty treat minority graduate students comparably to majority graduate students.
Departmental faculty are genuinely interested in graduate students.
Departmental faculty are capable teachers.
Departmental faculty are open to new ideas.
My advisor has helped me obtain an assistanship or other financial support for my research.
I've had little opportunity to develop a mentoring relationship with a faculty member.

Peer Interactions (Alpha= .62)
I've frequently met informally with other graduate students in study groups.
I've seldom participated in departmental social activities.
I've not developed close personal relationships with other graduate students.
I'm satisfied with my social life in the department.

Intellectual Involvement (Alpha= .64)
I'm dissatisfied with my intellectual development since enrolling in this department.
I'm satisfied with my academic experience in the department.
I have performed academically as well as I anticipated I would.
My course work in general has been intellectually difficult.
My out -of-class assignments have been excessively demanding of my time.
In general, my classes have been too large.
Most of my courses have lacked intellectual stimulation.
I feel I've been given an opportunity to show what I can do.
Nonclassroom interactions with faculty have had a positive influence on my intellectual growth.

Intention to persist (Alpha= .73)
I doubt that I can successfully complete the program requirements.
I'd chose a different field if it paid the same as the one I'm in now.
I am confident I made the right decision to attend graduate school.
I will probably transfer to another institution prior to degree completion.
If I had a chance to attend another school, without losing anything in the transfer, I'd do so.
The research orientation in my department does more to enhance UIC than benefit the students.
I am confident I made the right decision to enroll at UIC.
I am likely to interrupt my studies for at least one term.
The degree I am currently working toward is important for my future occupational plans.

Perception of Growth measures

All of the items below ranged from 1= None at all to 5= Very much.

People or Human Relations competency (Alpha= .87)

Being sensitive to people's feelings
Being sensitive to other's values.
Dealing with people.
Being personally involved.
Influencing and leading others.

Data or Research Competency (Alpha= .69)

Testing theories and ideas.
Designing experiments.
Analyzing quantitative data.

Idea of Reflective Thinking competency (Alpha= .81)

Experimenting with new ideas.
Creating new ways of thinking and doing.
Building Conceptual models.
Imagining implications of ambiguous situations.
Committing yourself to objectives.